

**2.6** Practice A

In Exercises 1–12, graph the function. Label the vertex and axis of symmetry.

1.  $f(x) = (x - 2)^2$

2.  $f(x) = (x + 1)^2$

3.  $g(x) = (x + 2)^2 + 4$

4.  $h(x) = (x - 3)^2 - 2$

5.  $y = -3(x - 1)^2 + 3$

6.  $f(x) = 4(x + 2)^2 - 1$

7.  $y = x^2 - 2x + 1$

8.  $y = 3x^2 + 6x + 1$

9.  $y = -3x^2 + 6x + 4$

10.  $f(x) = -x^2 + 6x - 3$

11.  $g(x) = -x^2 + 2$

12.  $f(x) = 5x^2 - 4$

13. Explain why you cannot use the axes of symmetry to distinguish between the quadratic functions  $y = 3x^2 + 12x + 1$  and  $y = x^2 + 4x + 5$ .

14. Which function represents the narrowest parabola? Explain your reasoning.

A.  $y = x^2 + 3$

B.  $y = 0.5x^2 - 2$

C.  $y = 3(x + 2)^2$

D.  $y = -2x^2 + 1$

In Exercises 15–18, find the minimum or maximum value of the function.

Describe the domain and range of the function, and where the function is increasing and decreasing.

15.  $y = 5x^2 + 2$

16.  $y = 4x^2 - 3$

17.  $y = -x^2 + 4x - 1$

18.  $f(x) = -2x^2 + 4x + 9$

19. The number of customers in a grocery store is modeled by the function  $y = -x^2 + 10x + 50$ , where  $y$  is the number of customers in the store and  $x$  is the number of hours after 7:00 A.M.

a. At what time is the maximum number of customers in the store?

b. How many customers are in the store at the time in part (a)?

In Exercises 20 and 21, use completing the square to find the vertex of the parabola or the center and radius of the circle. Then graph the equation.

20.  $-4x^2 + 16x - y + 2 = 0$

21.  $x^2 + y^2 - 4x + 12y - 8 = 0$